Waiting for Cataract Surgery in Alberta

Technical Report

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TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

METHODS 1
RESULTS 1
CONCLUSIONS 1

INTRODUCTION 2

METHODS 2

DEFINING A CATARACT SURGERY 2
DEFINING FIRST EYE SURGERY 2
DEFINING WAIT TIME 3
STATISTICS 3

RESULTS 4

TABLES 5

TABLE 1 RATE PER 1,000 AND OVERALL 95% CONFIDENCE INTERVAL OF FIRST/SECOND COMBINED EYE CATARACT SURGERY IN ALBERTA 5
TABLE 2 MEDIAN WAIT (DAYS) AND THE INTERQUARTILE RANGE(FIRST AND THIRD QUARTILE) FOR FIRST EYE CATARACT SURGERY IN ALBERTA SERVICE REGIONS (N = FIRST EYE CATARACT SURGERIES) 6
TABLE 3 MEDIAN ELAPSED TIME (DAYS) AND THE INTERQUARTILE RANGE (FIRST AND THIRD QUARTILE) BETWEEN FIRST AND SECOND EYE CATARACT SURGERY IN ALBERTA SERVICE REGIONS (N = SECOND EYE CATARACT SURGERIES) 7
TABLE 4 RESULTS FROM STEPWISE SELECTION OF DETERMINING FACTORS FOR THE FIRST EYE WAIT TIME (N= 34, 994 FIRST EYE SURGERIES) IN ORDER OF SELECTION 8
TABLE 5 9
RESULTS FROM STEPWISE SELECTION FOR DETERMINING FACTORS FOR ELAPSED TIME BETWEEN FIRST AND SECOND EYE SURGERY (N= 19,962 SECOND EYE SURGERIES) IN ORDER OF SELECTION.) 9

DISCUSSION 10

LIMITATIONS 11

REFERENCES 12

APPENDICES 14

APPENDIX 1 14
AGE-SEX-ADJUSTED FIRST EYE CATARACT SURGERY RATES PER 100,000 POPULATION* BY YEAR AND RECIPIENT REGION 14
APPENDIX 2 15
AGE-SEX-ADJUSTED TOTAL CATARACT SURGERY RATES PER 100,000 POPULATION * IN ALBERTA BY YEAR AND RECIPIENT REGION 15
APPENDIX 3 16
WAITING TIME FOR FIRST EYE CATARACT SURGERY IN ALBERTA BY YEAR AND RECIPIENT REGION 16
APPENDIX 3 (CONTINUED) 17

ELAPSED TIME BETWEEN FIRST AND SECOND CATARACT SURGERIES IN ALBERTA BY YEAR AND RECIPIENT REGION 17
APPENDIX 4 18
WAITING TIME FOR FIRST EYE CATARACT SURGERY IN ALBERTA BY YEAR AND SERVICE REGION 18
APPENDIX 4 (CONTINUED) 19
ELAPSED TIME BETWEEN FIRST AND SECOND CATARACT SURGERIES IN ALBERTA BY YEAR AND SERVICE REGION 19
APPENDIX 5 DISTRIBUTION OF OPHTHALMOLOGISTS IN ALBERTA BY YEAR AND SERVICE REGION 20

BIOGRAPHICAL INFORMATION 21

YAN JIN 21
CORRINE TRUMAN 22
K.C. CARRIERRE 23
DR. DAVID JOHNSON 24

EXECUTIVE SUMMARY

Methods

We compared the wait for cataract surgery in Alberta hospitals and private facilities. Wait for first eye, elapsed time between first and second eye and rate of cataract surgery was extracted from physician claims during 1996/97 to 1999/00. A statistical selection technique was used to compare the relative importance of various factors determining wait and elapsed times.

Results

We found the median wait (n=34,996) increased by 21% (55 to 70 days) but elapsed time (n=19,962) decreased by 26% (70 to 52 days). The proportion of surgeries done in private facilities varied from 0% in non-metropolitan regions, approximately 20% in Capital region, and increasing from 60% to nearly 100% in Calgary region. The median wait for first eye surgery and the duration between first and second eye surgery were 1 and 21 days longer if surgery was performed in hospital rather than a private facility. The relative wait for private facility surgery compared to hospital surgery was 80% shorter. The relative elapsed time for private clinic surgery compared to hospital surgery was 70% shorter. Comparing the effect of facility type to other factors, the relative wait was shorter by about half in metropolitan patients who had surgery performed in a non-metropolitan region, shorter by about 80% in those with high volume surgeons and 25% longer for those whose surgeons work in multiple regions. Comparing the effect of facility type to other factors, the relative elapsed time was about twice as long for those whose surgeons work in both hospital and private sites and about 40% shorter for those with high volume surgeons. Each of these surgical practice factors was more influential than that of facility type (hospital or private) in determining wait and elapsed time.

Conclusions

In Alberta, the provision of cataract surgery is complex. Both hospitals and private clinics perform cataract surgery. The provincial rate of cataract surgery was relatively constant between years. The rate of first eye surgery decreased and the rate of second eye surgery increased. As well, the wait for first eye cataract surgery increased and the elapsed time from first to second eye surgery decreased. Wait for first eye or elapsed time between first and second eye cataract surgery was influenced more by the surgical practice profile rather than the facility type (hospital or private). After adjusting for all other relevant factors, waits and elapsed times were shorter in private facilities.

INTRODUCTION

Since July 1995, Alberta regional health authorities can provide cataract surgery within a publicly funded hospital or outsource this function by contract to a for-profit, Alberta College of Physician and Surgeons sanctioned independent clinic[1] In both instances funding is public, however private clinics provide all medically necessary resources other than physician fees. Regional health authorities may choose to outsource a surgical procedure because of limited operating room capacity, perceived cost advantage, or simply to maintain the traditional system that evolved to provide this service. The standard business practice of outsourcing has been perceived as a threat to the Canadian Medicare system [1,2] and has been widely discussed as a national political issue. This study examines how providing cataract surgery in public and private facilities during the years 1996 to 2000 impacts upon cataract surgery wait and rate. The purpose of this study is not to propose public policy, but rather to provide information to those involved in this important discussion.

METHODS

Defining a Cataract Surgery

Intra capsular cataract extractions with or without intraocular lens replacement (Canadian Classification of Procedures and Diagnostic/Therapeutic Procedures: CCPx=27.72) were extracted from the physician claims file maintained by Alberta Health and Wellness. Only surgeries performed by Alberta ophthalmologists for Alberta residents in fiscal years 1996/97 to 1999/00 were selected.

Defining First Eye Surgery

Only waiting time for a first eye surgery was considered in the waiting time analysis because over the past few years there has been an increasing trend for ophthalmologists to automatically book the second eye surgery a few weeks after the first eye. The surgery was defined as a first eye if there was no another claim with CCPx=27.72 within a two-year calendar period prior to the cataract surgery claim.

Defining Wait Time

Wait time for first eyes was defined as the interval between two listed service dates [17]. The end point of the wait period is the date of the cataract surgery. The last pre-operative visit starts the wait period. The last pre-operative visit is defined as the service date of the last relevant claim by the ophthalmologist who performed the procedure within a two-year period prior to the procedure date. Only those claims in which the first (primary) diagnosis was listed as cataract (ICD9-CM 366) and the service listed as consultation, evaluation, or limited exam (determined by CCPx codes) were deemed relevant. If no claim by the ophthalmologist that performed the surgery was retrieved, the surgery was not included in the wait time determination for first eyes. Using this method, median wait time for first eye surgery and interval between first and second eye surgery is reported. Median wait time (time to clear 50% of patients) is used to describe wait as the mathematical average (mean) is affected by a few patients that waited a long time (i.e. up to 730 days).

Statistics

Age (0-49,50-64, 65-79, 80+) – sex standardized rates using the mid-fiscal year population of 1999/00 as the reference year and the 95% confidence intervals of the median were calculated. Overall rates between regions and Alberta in any one year and between years for any one region or Alberta were compared by T statistic[16]. If the T statistic was significant, individual rate differences were compared using an overall 95% confidence interval adjusting for multiple comparisons. Multiple comparisons were made when contrasting the 3 yearly rates to that of 1996/97 and the three service regions to the overall Alberta rate. A forward stepwise selection of factors was used to determine the order of importance in influencing waits and elapsed times. We used the natural log of waiting time for first eye surgery or elapsed time between first and second eye surgery measured in days. The factors investigated were: age (< 50, 50 to 64, 65 to 84 and ≥ 85), sex, year, region surgery performed (Calgary, Capital, non-metropolitan health regions), region of residence (Calgary, Capital, non-metropolitan health regions), surgery performed in hospital or private facility, patient living in Calgary or Capital having surgery performed in a non-metropolitan region, total volume of first and second eye cataract surgery performed by the ophthalmologist during the four years (low volume; 1st quartile , medium volume, or high volume; 4th quartile), ophthalmologist performs less than 95% of first and second eye cataract surgery during the four year study period in one region only (i.e. multiple region surgeon), ophthalmologist performs less than 95% of first and

second eye cataract surgery during the four year study period in either hospital or private facility but not both (i.e. multiple site surgeon), and Alberta Health Care Insurance premium assistance level (years 1996/97,1997/98 and 1998/99 only). The relative ratios and their 95% confidence intervals due to each factor were calculated in Tables 4 and 5. Spearman correlation coefficients were calculated as required. SAS (version 6.12) was used for statistical calculations.

RESULTS

There were 63,405 public funded cataract surgeries performed in Alberta during 1996/97 to 1999/00. 43,334 (68%) operations were for first eye and 19,966 (32%) for second eye. 105 cases were not identified as either first or second eye (i.e. more than two cataract surgery claims for a particular patient). 7,724 (18%) surgeries on first eye were not associated with a relevant pre-operative claim. 614 (1%) of surgeries were misclassified as first eye (second surgery done more than two years after first surgery) after coalescing the four years data and were subsequently reclassified as second eye surgery. Thus, the final study first eye cohort number was 34,996 (one first eye surgery per person). 69% of the final cohort had only one pre-operative claim and 88% had no more than two claims. In 1999/00, cataract surgery was performed in 12 health regions. Private clinics for cataract surgery exist in Calgary (n=5) and Capital (n=3). In 1999/00, Alberta ophthalmologists (n=50) performed cataract surgery in hospitals (n=22), private clinics (n=24), and both hospital and private clinics (n=4). In 1999/00 74% patients had surgery performed in their home region, 4% were "exported" by necessity (service not offered in that region), and 22% migrated by choice/recommendation (service offered in that region but performed in another region). Low (n=16), mid (n=33), and high volume ophthalmologists (n=16) were defined as performing 2 to 100, 122 to 1,333, and 1,338 or more total cataract surgeries respectively during the four year study period.

TABLES

Table 1 shows age-sex standardized cataract surgery in Alberta from 1996/97 to 1999/00 by region and year. The provincial rate of first eye surgery decreased while the total provincial rate for all cataract surgery remained stable, an increase in second eye surgery is implied over the study period. The rate of total eye cataract surgery generally also appears to be stable for the Capital region. The Calgary region significantly decreased over the 4 year period. The non-metropolitan region 1999/00 rate was significantly higher compared to the 1996/97 rate. However, the non-metropolitan region had the lowest rate (30% lower) of cataract surgery among the three regions in all years. Further, although there appears to be a positive association between rate and wait times in non-metropolitan region (greater wait with higher rate!), there were no such strong tendency in Capital and Calgary regions. Overall, the Spearman's correlation was about 0.3 (p-value of 0.36).

Table 1

Rate per 1,000 and overall 95% confidence interval of first/second combined eye cataract surgery in Alberta

		1996/97	1997/98	1998/99	1999/00
Calgary	First eye	430(412-447) ⇑	382(366-399) ⇩	407(390-424) ⇑ ⇩	390(374-406) ⇑ ⇩
Capital	First eye	398(381-415)	385(368-401)	386(370-402)	377(362-393) ↓
Non-metropolitan region	First eye	362(349-376) ⇓	359(346-372) ⇓	350(337-363) ⇓	358(345-371) ⇓
Alberta	**First eye**	**391(382-400)**	**373(365-382)** ⇩	**377(368-385)** ⇩	**373(365-382)** ⇩
Calgary	All Cataracts	652(626-679) ⇑	561(537-586) ⇩	607(582-631) ⇑ ⇩	605(582-631) ⇑ ⇩
Capital	All Cataracts	578(554-603)	560(536-584)	583(559-607)	589(565-613)
Non-metropolitan region	All Cataracts	509(491-527) ⇓	520(502-539) ⇓	516(497-534) ⇓	536(517-554) ⇓ ⇧
Alberta	**All Cataracts**	**569 (556-582)**	**544 (531-556)** ⇩	**561 (549-574)**	**572 (559-584)**

Rates are per 100,000 and overall alpha = 0.05. Actual confidence interval is 98.33%, which adjusts 95% confidence interval for multiple comparisons.

Arrows indicate $p<0.05$ for regional comparison to Alberta in each year (filled arrows) or for yearly trend comparison to that of 1996/97 for each region (unfilled arrows).

Table 2 shows the median waiting time by region and year performed. The median Alberta wait days increased over the four years by 27% (55 to 70 days). The wait in Calgary, Capital, and non-metropolitan regions were similar except for Calgary during one year (1998/99). 91% of first eye cataract surgery was performed within six months. The proportion of surgeries done in private facilities varied from 0% in non-metropolitan regions, approximately 20% in Capital, and increasing from 60% to nearly 100% in Calgary. Overall crude median wait for first eyes was similar in metropolitan and non- metropolitan regions (62 days), in hospital (62 days) and private facilities (61 days). The difference between hospital and private waits varied between years. In Capital, private facility waits were consistently shorter than hospital waits. So few cataract surgeries were performed in Calgary hospitals that valid comparisons cannot be made. The wait in Calgary private facilities was longer or shorter than Capital hospitals depending on the year.

Table 2

Median wait (days) and the interquartile range(first and third quartile) for first eye cataract surgery in Alberta service regions (n = first eye cataract surgeries)

	1996/97	1997/98	1998/99	1999/00	All years
Calgary					
Hospital	69(43, 97) n=1,286	40(29, 75) n=31	68(41, 81) n=10	N insufficient to report	69 (42, 97) n=1,331
Private	39(18, 69) n=1,443	56(35, 93) n=2,842	83(47, 143) n=3,260	69(38, 133) n=3,203	63 (35, 119) n=10,580
Both	54(31, 90) n=2,729	56(35, 93) n=2,873	82(47, 142) n=3,209	69(38, 133) n=3,100	64 (36, 115) n=11,911
Capital					
Hospital	55(37, 111) n=2,492	54(37, 87) n=2,508	66(42, 117) n=2,40	76(47, 140) n=2,562	62 (41, 114) n=10,302
Private	36(20, 76) n=432	51(34, 85) n=549	55(39, 78) n=604	54(36, 78) n=670	51 (34, 79) n=2,255
Both	54(35, 103) n=2,924	54(36, 86) n=3,057	63(41, 111) n=3,344	70(43, 124) n=3,232	59 (39, 107) n=12,557
Non-metropolitan region	56(40, 86) n=2,216	55(38, 84) n=2,609	60(40, 89) n=2,666	72(48, 99) n=3,037	62 (41, 92) n=10,528
Alberta	**55(35, 91) n=7,869**	**55(36, 88) n=8,539**	**68(41, 111) n=9,219**	**70(44, 117) n=9,369**	**62 (39, 103) n=34,996**

Table 3 shows the elapsed time from first to second eye surgery by region and year. The elapsed time decreased over the study period. Overall crude median elapsed time from first to second eye cataract surgery was shorter in metropolitan (56 days) vs. non- metropolitan regions (71 days) and longer in hospital (70 days) vs. private facility (49 days). The correlation between first eye wait and elapsed time is -0.291 (p= 0.358).

Table 3

Median elapsed time (days) and the interquartile range (first and third quartile) between first and second eye cataract surgery in Alberta service regions (n = second eye cataract surgeries)

	1996/97	1997/98	1998/99	1999/00	All years
Calgary					
Hospital	126(77, 257) n=698	91(63, 231) n=17	154(72, 264) n=8	N insufficient to report	121 (77, 254) n=725
Private	28(8, 99) n=1,513	63(20, 161) n=1,865	63(21, 175) n=1,973	56(20, 147) n=2,100	56 (14, 147) n=7,451
Both	61(14, 147) n=2,211	63(21, 161) n=1,882	64(21, 175) n=1,981	56(20, 147) n=2,102	63 (18, 154) n=8,176
Capital					
Hospital	77(18, 203) n=1,174	49(14, 158) n=1,262	42(14, 162) n=1,360	43(17, 170) n=1,304	53 (14, 175) n=5,100
Private	28(14, 119) n=441	41(14, 126) n=359	30(14, 133) n=398	28(14, 83) n=408	28 (14, 118) n=1,606
Both	63(14, 189) n=1,615	42(14, 154) n=1,621	42(14, 154) n=1,758	40(14, 154) n=1,712	42 (14, 161) n=6,706
Non-metropolitan region	105(49, 210) n=950	93(35, 217) n=1205	56(21, 133) n=1318	56(17, 140) n=1563	71 (28, 168) n=5081
Alberta	**70(19, 175) n=4,776**	**63(21, 170) n=4,753**	**56(21, 154) n=5,057**	**52(16, 147) n=5,377**	**61 (20, 161) n=19,963**

Tables 4 and 5 report the influencing factors determining wait and elapsed time in order of descending importance. The relative ratio of wait and elapsed time compared to its reference (as indicated in parenthesis) is listed for each explanatory factor. The relative risk of wait and elapsed times in hospital compared to private facilities were 1.269 (95% CI of 1.228-1.311) and 1.45 (95% CI of 1.364 – 1.543). Note the crude wait and elapsed times reported in tables 2 and 3 of 62 and 70 days respectively in hospital and 61 and 49 days respectively in private facilities. Although not shown in the tables, the overall crude median wait for first eyes was 61 days for patients with high volume surgeons, 64 days for those with low volume surgeons and 62 days for those with medium volume surgeons. Overall crude median elapsed time from first to second eye cataract surgery was 38 days for patients with high volume surgeons, 106 days for those with low volume surgeons and 101 days for those with medium volume surgeons. When adjusted for all other factors, the relative risk ratios were 1.239 (first eye wait) and 2.576 (elapsed time) for patients

with low volume surgeons and 1.121 (first eye wait) and 2.692 (elapsed time) for those with medium volume surgeons. Both overall crude median waits (62 vs. 45 days) and elapsed time (63 vs. 28 days) were longer if a metropolitan patient had surgery performed in a metropolitan region rather than travelling to a non-metropolitan region. The relative risk of remaining in a metro region was 1.721 for wait and 1.689 for elapsed time. Overall crude median wait (69 vs. 58 days) and elapsed time (67 vs. 56 days) were longer (relative risk of 1.259 and 1.327 respectively) if their ophthalmologist practiced in multiple regions. Overall crude median wait (68 vs. 55 days) and elapsed time (77 vs. 44 days) were longer (relative risk of 1.050 and 1.760 respectively) if their ophthalmologist practiced in both hospital and private sites. Full or partial Alberta Health Care premium subsidy was not found to have any significant effect on wait.

Table 4

Results from stepwise selection of determining factors for the first eye wait time (n= 34, 994 first eye surgeries) in order of selection

Factors entered for Determining log (wait)	Relative wait ratio (R)	95% CI for R
Year		
1997/98 (vs 1996/97)	1.050	1.022 – 1.079
1998/99 (vs 1996/97)	1.279	1.245 – 1.314
1999/00 (vs 1996/97)	1.361	1.325 – 1.399
Multiple region ophthalmologist (vs single region ophthalmologist)	1.259	1.227 - 1.292
Remained in metro region (vs service in non-metro region)	1.721	1.615 - 1.834
Volume		
Low (vs High)	1.239	1.124 – 1.366
Medium (vs High)	1.121	1.097 – 1.147
Age group		
50-64 (vs 0-49)	1.109	1.056 – 1.164
65-84 (vs 0-49)	1.197	1.145 – 1.252
85+ (vs 0-49)	1.220	1.157 – 1.286
Hospital (vs private clinic)	1.269	1.228 - 1.311
Service region		
Calgary (vs Capital)	1.294	1.227 – 1.365
Non-metro regions (vs Capital)	1.165	1.122 – 1.211
Recipient region		
Calgary (vs non-metro regions)	1.106	1.063 – 1.151
Capital (vs non-metro regions)	1.177	1.135 – 1.221
Female (vs male)	1.064	1.044 - 1.084
Multiple site type ophthamologist (vs single site type ophthalmologist)	1.050	1.027 - 1.073

Note: the factors were selected if they satisfied the selection criteria set at $p<0.05$. The reference group for each factor is indicated in parenthesis.

Table 5

Results from stepwise selection for determining factors for elapsed time between first and second eye surgery (n= 19,962 second eye surgeries) in order of selection.)

Factors entered for determining log (elapsed times)	Relative wait ratio (R)	95% CI for R
Volume		
Low (vs High)	2.576	2.059 - 3.221
Medium (vs High)	2.692	2.576 – 2.813
Multiple site type ophthalmologist (vs single site type ophthalmologist)	1.760	1.693 - 1.831
Hospital (vs private clinic)	1.450	1.364 - 1.543
Recipient region		
Calgary (vs non-metro regions)	1.270	1.187 – 1.359
Capital (vs non-metro regions)	0.984	0.913 – 1.061
Multiple region ophthalmologist (vs single region ophthalmologist)	1.327	1.262 - 1.395
Year		
1997/98 (vs 1996/97)	0.974	0.923 – 1.028
1998/99 (vs 1996/97)	0.869	0.824 – 0.916
1999/00 (vs 1996/97)	0.804	0.763 – 0.848
Service region		
Calgary (vs Capital)	0.921	0.836 - 1.015
Non-metro regions (vs Capital)	1.446	1.334 – 1.567
Remained in metro region (vs service in non-metro region)	1.689	1.489 - 1.916

Note: the factors were selected if they satisfied the selection criteria set at $p<0.05$. The reference group for each factor is indicated in parenthesis.

DISCUSSION

The dramatic increase in utilization for cataract surgery over the last 15 years cannot simply be ascribed to a slowly aging population[3]. Waiting for surgery occurs in most publicly funded health systems[4]. The issue of queuing for surgery is being discussed in the national political arena. Experts impute the validity of the wait list [5] and state that socialized medicine is threatened by providing care in a proprietary facility [6,7]. Information on actual waits is limited due to lack of a standard province-wide registry. Without a province-wide registry, patients waiting in local physician lists may be duplicated on another list or remain even after canceling the surgery [5]. This study probes the waiting times of those that had surgery using physician claims and methodology used by others[17].

Why do waits vary?

he number of cataract surgeries performed in any one region is either explicitly determined by quota (i.e. Capital, Calgary) or implicitly set by allocating limited operating room time to ophthalmologists. Patients are added to the wait list by ophthalmologists according to their individual indications for surgery and the prevalence of the disease where the ophthalmologist practices. The variation in wait time simply reflects the variation in demand when rates are stable. In part, the increase in first eye wait was due to a decreased elapsed time to second eye surgery. The ability to decrease wait by simply increasing rate is limited in publicly funded health systems as demand increases when rate is increased[12, 13]. Focus upon the rate of surgery rather than the wait may be more important for policy makers[14].

Similar to Manitoba[2], our proxy for income levels (health care insurance subsidization) did not influence wait. We did find other influencing factors. For example, some surgeons practiced not only in both hospital and non-hospital sectors but also in multiple regions. This practice pattern may have allowed them to gain more operating room time but still did not decrease their wait or elapsed time below the overall median. Patients in metropolitan regions who choose (or were directed) to have surgery in a non metropolitan region decreased their median wait by 17 days and that of elapsed time by 35 days. When patients are asked, they are not willing to pay in order to decrease their wait for cataract surgery [11]. This study demonstrates that patients may be willing to travel small distances in order to decrease wait. Ophthalmologist may also work in multiple regions in an attempt to decrease wait. As yet, the volume of migratory surgery is small but may be a future threat to controlling the rate of cataract surgery.

Why did first eye wait increase in Alberta?

Although difference in cataract prevalence over years cannot be dismissed out of hand, the increase first eye wait over a short time span of only four years seems biologically unlikely for pathology that requires many years to develop. Those patients receiving second eye surgery could expect a shortening of the elapsed time from the first eye surgery. In part, the relative importance physicians and/or patients attach to second eye surgery increased with respect to the first eye. As all cataract surgery in Alberta is publicly funded, direct patient payment is not a determinant of wait or elapsed time [9,10]. Patient demand, identification of pathology, referral of patients with cataracts, and physician practice style may influence demand within the short time span of this study.

LIMITATIONS

Administrative data does not include indications for service, severity of illness, outcome, or patient's preference. Waiting time may be over estimated for those that actually had surgery. Some patients may have their only preoperative visit on the day of surgery. Claims on the same day of surgery are bundled within the surgery claim. Cataract surgery patients may visit more than one ophthalmologist preoperatively. Although we found that for some patients, a pre-operative visit to another ophthalmologist was closer to the date of surgery than the pre-operative visit to the ophthalmologist who performed the operation, we do not know during which visit the patient's name was put on the waiting list. We estimated wait for only those that had surgery. Patients on the wait list but not having surgery would not have been captured. Thus we likely underestimated wait time from the perspective of all those initially placed on the wait list [15].

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APPENDICES

Appendix 1

Age-sex-adjusted first eye cataract surgery rates per 100,000 population* by year and recipient region

Recipient region	1996/97			1997/98			1998/99			1999/00		
	Rate	Confidence interval (95%)		Rate	Confidence interval (95%)		Rate	Confidence interval (95%)		Rate	Confidence interval (95%)	
		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI
Chinook (01)	404	374	433	423	393	453	437	407	467	415	386	444
Palliser (02)	325	291	360	331	296	366	303	270	336	322	288	356
Headwaters (03)	447	398	497	348	305	391	378	334	422	335	294	376
Calgary (04)	430	415	444	382	369	396	407	393	420	390	377	403
RHA 5 (05)	398	348	449	372	325	420	364	317	411	369	323	416
David Thompson (06)	283	259	307	301	277	326	293	270	317	347	321	372
East Central (07)	336	306	367	346	316	377	307	279	336	327	297	356
Westview (08)	398	350	447	338	294	382	378	333	424	317	276	358
Crossroads (09)	449	401	497	368	325	412	328	275	382	389	331	446
Capital (10)	398	384	412	385	371	398	386	373	399	377	365	390
Aspen (11)	352	311	393	341	301	381	310	272	348	349	309	388
Lakeland (12)	401	365	437	419	382	455	378	344	413	404	369	440
Mistahia (13)	354	309	399	349	305	393	416	369	464	344	302	386
Peace (14)	291	213	369	359	274	445	308	229	388	301	224	378
Keeweetinok Lakes (15)	257	175	339	334	240	428	295	207	383	333	239	427
Northern Lights (16)	392	257	527	359	229	489	345	219	471	405	276	534
Northwestern (17)	211	97	324	411	263	559	384	235	534	362	229	496
Alberta	391	384	399	373	366	380	377	370	384	373	366	380

*: Standardized to 1999/2000 mid-fiscal year Alberta population

Appendix 2

Age-sex-adjusted total cataract surgery rates per 100,000 population * in Alberta by year and recipient region

Recipient region	1996/97			1997/98			1998/99			1999/00		
	Rate	Confidence interval (95%)		Rate	Confidence interval (95%)		Rate	Confidence interval (95%)		Rate	Confidence interval (95%)	
		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI		Lower CI	Upper CI
Chinook (01)	538	500	576	619	577	660	620	579	661	631	589	673
Palliser (02)	436	391	481	444	399	489	431	386	476	460	414	506
Headwaters (03)	647	575	720	514	452	577	580	514	646	530	468	591
Calgary (04)	652	630	674	561	542	581	607	586	627	606	586	626
RHA 5 (05)	598	524	672	543	473	612	538	470	607	558	490	627
David Thompson (06)	423	387	459	446	409	483	446	410	482	498	461	534
East Central (07)	482	439	525	491	448	535	443	403	484	485	443	527
Westview (08)	552	484	620	521	456	587	599	527	670	470	410	530
Crossroads (09)	624	556	692	502	442	561	498	418	578	570	487	654
Capital (10)	578	558	599	560	540	579	583	564	603	589	569	608
Aspen (11)	497	439	554	502	444	561	444	390	498	524	465	584
Lakeland (12)	552	502	601	628	574	682	586	532	639	656	600	712
Mistahia (13)	487	426	548	502	440	563	574	510	638	494	437	550
Peace (14)	434	322	546	512	393	631	423	316	530	451	338	563
Keeweetinok Lakes (15)	386	265	506	435	308	562	420	295	546	457	324	590
Northern Lights (16)	518	334	702	587	378	795	526	335	718	603	418	788
Northwestern (17)	300	154	445	516	315	717	500	313	687	578	377	779
Alberta	569	558	580	544	534	554	561	551	572	572	561	582

*: Standardized to 1999/2000 mid-fiscal year Alberta population

Appendix 3

Waiting time for first eye cataract surgery in Alberta by year and recipient region

Recipient region	1996/97				1997/98				1998/99				1999/00			
	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI
Chinook (01)	586	52	50	54	680	60	57	63	722	77	74	81	730	91	89	93
Palliser (02)	249	43	41	51	276	46	43	50	273	48	44	52	297	77	65	90
Headwaters (03)	209	43	39	51	190	56	50	68	230	82	69	93	204	85	72	94
Calgary (04)	2,247	55	53	56	2,319	57	55	59	2,626	83	81	85	2,500	69	68	72
RHA 5 (05)	135	55	44	66	167	62	57	67	181	82	76	89	186	64	57	74
David Thompson (06)	195	48	41	53	338	55	50	62	461	65	61	70	544	66	62	69
East Central (07)	368	73	66	81	439	69	62	69	401	70	69	78	431	84	81	91
Westview (08)	197	57	53	62	202	52	49	56	240	69	62	72	225	62	58	73
Crossroads (09)	281	70	66	76	237	62	55	70	131	58	54	66	161	74	69	78
Capital (10)	2,461	54	52	55	2,641	53	50	54	2,917	62	59	64	2,993	66	64	68
Aspen (11)	239	56	52	64	251	55	50	57	247	62	56	66	273	63	58	66
Lakeland (12)	423	46	41	54	468	38	34	46	421	41	40	47	470	50	48	53
Mistahia (13)	168	54	50	57	186	54	47	56	224	54	48	56	197	89	84	95
Peace (14)	36	44	36	57	53	55	43	69	46	45	33	57	48	85	62	99
Keeweetinok Lakes (15)	33	76	55	110	37	60	46	80	42	63	50	82	46	83	62	93
Northern Lights (16)	28	51	41	79	27	42	34	59	32	75	47	126	41	60	47	86
Northwestern (17)	14	62	36	152	28	54	43	76	25	75	61	85	23	82	64	110
Alberta	7,869	55	54	55	8,539	55	55	55	9,219	68	67	69	9,369	70	69	71

Appendix 3 (Continued)

Elapsed time between first and second cataract surgeries in Alberta by year and recipient region

Recipient region	1996/97				1997/98				1998/99				1999/00	
	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days
Chinook (01)	239	119	106	147	361	119	106	133	326	105	98	119	371	104
Palliser (02)	113	121	98	154	120	119	84	161	126	105	77	154	139	120
Headwaters (03)	136	50	40	77	118	63	49	84	130	70	49	91	136	77
Calgary (04)	1,657	70	63	77	1,396	70	63	72	1,553	70	63	77	1705	56
RHA 5 (05)	119	63	42	90	101	63	42	84	108	56	42	82	114	63
David Thompson (06)	254	28	22	35	278	35	28	49	293	28	26	35	298	35
East Central (07)	211	91	70	113	209	70	49	98	189	78	49	112	201	70
Westview (08)	96	46	28	70	120	49	42	91	149	35	28	42	100	48
Crossroads (09)	125	70	42	105	99	70	42	105	69	35	28	102	73	28
Capital (10)	1,387	63	56	70	1,392	42	35	49	1,601	35	29	38	1645	33
Aspen (11)	114	63	42	98	130	42	32	63	107	42	28	63	140	28
Lakeland (12)	174	77	63	98	250	49	35	77	235	28	21	35	286	21
Mistahia (13)	87	98	77	140	105	98	84	126	105	91	70	119	92	126
Peace (14)	26	84	63	154	28	133	54	219	20	105	42	392	25	91
Keeweetinok Lakes (15)	18	119	88	316	15	106	35	168	18	75	28	196	18	36
Northern Lights (16)	13	112	28	287	24	44	7	133	18	14	7	19	19	35
Northwestern (17)	7	112	28	715	7	28	7	105	10	158	14	616	15	119
Alberta	4,776	70	68	77	4,753	63	63	70	5,057	56	54	57	5377	52

Appendix 4

Waiting time for first eye cataract surgery in Alberta by year and service region

Recipient region	1996/97				1997/98				1998/99				1999/00			
	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI
Chinook (01)	608	51	50	53	694	61	58	64	794	75	72	79	810	91	89	93
Palliser (02)	190	42	40	53	226	45	42	48	194	44	42	47	194	84	66	117
Calgary (04)	2729	54	52	55	2873	56	55	58	3209	82	80	84	3100	69	68	73
David Thompson (06)	36	38	31	49	57	83	63	90	119	118	111	137	97	42	39	47
East Central (07)	136	111	99	111	216	83	83	90	218	83	81	84	240	111	109	112
Westview (08)	151	62	55	62	161	55	51	58	207	69	62	75	203	62	58	59
Crossroads (09)	530	76	71	80	429	63	62	69	256	55	55	58	317	69	69	70
Capital (10)	2924	54	51	55	3057	54	52	55	3344	63	62	65	3232	70	68	72
Aspen (11)	85	64	59	70	106	56	50	64	119	64	57	66	151	64	59	71
Lakeland (12)	319	31	27	33	513	26	25	27	557	34	33	35	808	46	46	48
Mistahia (13)	158	55	53	61	207	57	54	62	202	56	54	61	210	92	89	96
Alberta	7869	55	54	55	8539	55	55	55	9219	68	67	69	9369	70	69	71

*: Regions with small numbers are not reported

Appendix 4 (Continued)

Elapsed time between first and second cataract surgeries in Alberta by year and service region

Recipient region	1996/97				1997/98				1998/99				1999/00			
	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI	Number of Surgeries	Median Wait in days	Confidence interval (95%) Lower CI	Upper CI
Chinook (01)	224	133	119	167	337	125	111	140	343	105	98	119	401	105	98	112
Palliser (02)	61	217	140	294	78	165	126	231	69	217	105	294	78	161	126	266
Calgary (04)	2211	61	55	65	1,882	63	56	63	1,981	64	63	70	2,102	56	56	63
David Thompson (06)	40	35	28	47	33	28	19	55	72	26	21	28	27	63	63	77
East Central (07)	44	169	154	196	66	140	119	182	65	154	133	182	93	189	168	224
Westview (08)	68	49	35	63	98	49	42	63	113	35	28	56	89	35	28	49
Crossroads (09)	244	112	98	126	206	77	56	105	125	21	21	28	157	18	14	28
Capital (10)	1,615	63	49	70	1,621	42	35	51	1,758	42	35	44	1,712	40	35	42
Aspen (11)	36	46	35	98	48	49	42	70	48	35	28	63	73	28	21	28
Lakeland (12)	156	63	56	71	278	28	28	35	380	21	21	21	548	14	14	18
Mistahia (13)	77	91	77	112	106	111	98	140	101	98	84	133	95	126	112	161
Alberta	4,776	70	68	77	4,753	63	63	70	5057	56	54	57	5,377	52	49	56

*: Regions with small numbers are not reported.

Appendix 5

Distribution of Ophthalmologists in Alberta by year and service region

	1996/97		1997/98		1998/99		1999/2000	
Service RHA	Total practicing in Region	Those who predominately practice in region	Total practicing in Region	Those who predominately practice in region	Total practicing in Region	Those who predominately practice in region	Total practicing in Region	Those who predominately practice in region
Chinook (01)	3	3	3	3	3	3	3	3
Palliser (02)	4	3	3	3	3	3	3	2
Headwaters (03)							1	
Calgary (04)	33	32	27	26	25	25	25	25
RHA 5 (05)								
David Thompson (06)	3	2	2	2	1	1	1	1
East Central (07)	1		1		1		3	
Westview (08)	2		2		2		1	
Crossroads (09)	2		2		1		1	
Capital (10)	19	17	20	18	23	18	18	16
Aspen (11)	1		1		1		1	
Lakeland (12)	3	1	3	2	3	2	3	2
Mistahia (13)	1	1	1	1	1	1	1	1
Peace (14)								
Keeweetinok Lakes (15)	1				1			
Northern Lights (16)								
Northwestern (17)								

Those who predominately practice in region refers to the region in which the ophthalmologist performed the most number of surgeries during that year.

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